10. The eye-mountable device according to claim **1**, further comprising a power supply disposed on the substrate and electrically connected to the antenna and the controller, wherein the power supply is configured to convert power from radio frequency radiation received by the antenna into electrical power and to supply the electrical power to the controller.

11. The eye-mountable device according to claim **1**, wherein the controller is configured to indicate the measured amperometric current by modulating an impedance of the antenna.

12. The eye-mountable device according to claim **1**, wherein the electrochemical sensor is situated on a mounting surface of the substrate proximate the concave surface of the polymeric material.

13. The eye-mountable device according to claim **1**, wherein the polymeric material is a substantially transparent vision correction lens and is shaped to provide a predetermined vision-correcting optical power.

14. A system comprising:

an eye-mountable device including:

a transparent polymeric material having a concave surface and a convex surface, wherein the concave surface is configured to be removably mounted over a corneal surface and the convex surface is configured to be compatible with eyelid motion when the concave surface is so mounted;

a substrate at least partially embedded within the polymeric material;

an antenna disposed on the substrate;

a two-electrode electrochemical sensor disposed on the substrate and including:

a working electrode having at least one dimension less than 25 micrometers; and

a reference electrode having an area at least five times greater than an area of the working electrode; and

a controller electrically connected to the electrochemical sensor and the antenna, wherein the controller is configured to: (i) apply a voltage between the working electrode and the reference electrode sufficient to generate an amperometric current related to the concentration of an analyte in a fluid to which the eye-mountable device is exposed; (ii) measure the amperometric current; and (iii) use the antenna to indicate the measured amperometric current,

wherein a portion of the transparent polymeric material surrounds the working electrode and the reference electrode such that an electrical current conveyed between the working electrode and the reference electrode is passed through the at least partially surrounding portion of the transparent polymeric material; and

a reader including:

one or more antennae configured to:

transmit radio frequency radiation to power the eye-mountable device, and

receive indications of the measured amperometric current via backscatter radiation received at the one or more antennae; and

a processing system configured to determine a tear film analyte concentration value based on the backscatter radiation.

15. The system according to claim **14**, wherein the working electrode is situated sufficiently proximate the concave surface to detect an amount of the analyte dissolved in a tear film layer interposed between the corneal surface and the concave surface while the transparent polymeric material is mounted over the corneal surface.

16. The system according to claim **14**, wherein the working electrode is a microelectrode having at least one dimension approximately equal to 10 micrometers.

17. The system according to claim **14**, wherein the working electrode is a microelectrode having at least one dimension less than 10 micrometers.

18. The system according to claim **14**, wherein the working electrode and the reference electrode are each disposed on the substrate so as to be approximately coplanar.

19. The system according to claim **14**, further comprising a reagent that selectively reacts with the analyte, wherein the reagent is localized proximate the working electrode.

20. The system according to claim **14**, wherein the eye-mountable device further includes a power supply disposed on the substrate and electrically connected to the antenna and the controller, wherein the power supply is configured to convert power from radio frequency radiation received by the antenna into electrical power and to supply the electrical power to the controller,

wherein the controller is configured to indicate the measured amperometric current by adjusting an impedance of the antenna included in the eye-mountable device, and

wherein the reader is configured to wirelessly sense the impedance of the antenna.

21. A method comprising:

applying a voltage between a working electrode and a reference electrode sufficient to cause electrochemical reactions at the working electrode, wherein the working electrode and the reference electrode are embedded within an eye-mountable device having a concave surface and a convex surface, wherein the concave surface is configured to be removably mounted over a corneal surface and the convex surface is configured to be compatible with eyelid motion when the concave surface is so mounted, wherein the working electrode has at least one dimension less than 25 micrometers and the reference electrode has an area at least five times greater than an area of the working electrode, and wherein the working electrode and the reference electrode are arranged in the eye-mountable device such that the electrochemical reactions are related to a concentration of an analyte in a fluid to which the eye-mountable device is exposed;

while applying the voltage, measuring an amperometric current through the working electrode, wherein the eye-mountable device includes a polymeric material with a portion that at least partially surrounds the working electrode and the reference electrode such that an electrical current conveyed between the working electrode and the reference electrode is passed through the at least partially surrounding portion; and

wirelessly indicating the measured amperometric current via an antenna embedded within the eye-mountable device.

22. The method according to claim **21**, wherein the working electrode is a microelectrode having at least one dimension less than or approximately equal to 10 micrometers.

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